



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,135	02/14/2002	Seth R. Stern	100/11020	8863
21569	7590	08/24/2004	EXAMINER	
CALIPER LIFE SCIENCES, INC. 605 FAIRCHILD DRIVE MOUNTAIN VIEW, CA 94043-2234			BARTON, JEFFREY THOMAS	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,135

Applicant(s)

STERN ET AL.

Examiner

Jeffrey T Barton

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-5, 8-20 and 22-32 is/are rejected.
7) ☒ Claim(s) 6, 7 and 21 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 14 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20020903, 20021009.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: See Continuation Sheet.

Continuation of Attachment(s) 6). Other: IDS 20030227, Foreign Patent Document.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 102. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:
- a. On page 3, line 11, the word "contacting" is improperly repeated.
 - b. On page 12, line 28, Figure 3B is referenced, though Figure 3A appears to have been intended.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1-5, 8-11, and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Becker et al. (US 5,993,632)

Addressing claims 1 and 22, Becker et al disclose a system for and a method of applying an electrical current through a fluid-containing cavity comprising: providing a fluid-containing cavity (Column 3, lines 30-35); contacting two electrodes with the fluid in the cavity, both electrodes having a relevant surface area in contact with the fluid (Column 4, lines 5-16; Column 12,

Art Unit: 1753

lines 4-7); applying an alternating current from a current source to the fluid via these two electrodes (Column 7, lines 30-40); wherein the frequency and relevant surface area are selected to avoid generation of gas bubbles at either electrode (Column 23, lines 23-31; Column 24, lines 6-14 and 31-36)

Addressing claims 2, 3, 23, 24, and 25, Becker et al disclose using AC frequencies in excess of 10 kHz. (Column 7, lines 36-40)

Addressing claim 4, Becker et al disclose the electrodes being patterned on a first surface of the cavity (Column 4, lines 14-16) and the relevant surface area comprising a first edge of the first electrode that faces the second electrode along a path of the electrical current. (Figures 1C, 2B, and 2C, upon application of a potential between the electrodes of Figure 1C, the relevant areas will comprise electrode edges that provide the narrowest gap between electrodes)

Addressing claim 5, Becker et al disclose the first edge of the first electrode being configured to provide substantially uniform current across the first edge (Figure 1C, electrode digits are parallel, current will be uniform along most of the length of the digits)

Addressing claim 8, Becker et al disclose electrodes disposed on opposing surfaces of the cavity, with the relevant surfaces of the electrodes disposed in substantially directly facing opposition. (Figure 2B; Column 11, lines 41-48; Column 11, line 59 - Column 12, line 4)

Addressing claims 9-11, Becker et al disclose the preferred distance between the walls on which the opposing electrodes are disposed being between 20 and 200 microns. (Column 11, lines 41-48)

5. Claims 1-5, 8-11, and 22-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Becker et al. (US 6,641,708)

Addressing claims 1 and 22, Becker et al disclose a system for and a method of applying an electrical current through a fluid-containing cavity comprising: providing a fluid-containing cavity (Column 3, lines 50-55); contacting two electrodes with the fluid in the cavity, both electrodes having a relevant surface area in contact with the fluid (Column 4, line 39 - Column 5, line 2); applying an alternating current from a current source to the fluid via these two electrodes (Column 8, line 58 - Column 9, line 4); wherein the frequency and relevant surface area are selected to avoid generation of gas bubbles at either electrode (Column 4, lines 57-67; Column 16, lines 17-58; Column 49, lines 50-53)

Addressing claims 2, 3, 23, 24, and 25, Becker et al disclose using AC frequencies in excess of 10 kHz. (Column 8, line 67 - Column 9, line 4)

Addressing claim 4, Becker et al disclose the electrodes being patterned on a first surface of the cavity (Column 4, line 67 - Column 5, line 2) and the relevant surface area comprising a first edge of the first electrode that faces the second electrode along a path of the electrical current. (Figures 1B, 2B, and 2C, upon application of a potential between the electrodes of Figure 1B, the relevant areas will comprise electrode edges that provide the narrowest gap between electrodes)

Addressing claim 5, Becker et al disclose the first edge of the first electrode being configured to provide substantially uniform current across the first edge (Figure 1B, electrode digits are parallel, current will be uniform along most of the length of the digits)

Addressing claim 8, Becker et al disclose electrodes disposed on opposing surfaces of the cavity, with the relevant surfaces of the electrodes disposed in substantially directly facing opposition. (Figure 2D; Column 15, line 65 - Column 16, line 5; Column 16, lines 17-29)

Addressing claims 9-11, Becker et al disclose the preferred distance between the walls on which the opposing electrodes are disposed being between 20 and 600 microns. (Column 16, lines 1-5)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Becker et al (US 6,641,708) in view of Chow et al.

Becker et al disclose a method of applying an electrical current through a fluid-containing cavity comprising: providing a fluid-containing cavity (Column 3, lines 50-55); contacting two electrodes with the fluid in the cavity, both electrodes

having a relevant surface area in contact with the fluid (Column 4, line 39 - Column 5, line 2); and applying an alternating current from a current source to the fluid via these two electrodes. They also disclose the purposeful avoidance of electrolysis by voltage selection (Column 49, lines 50-53), which is the disclosed purpose of maintaining the voltage drop below 1V in the instant application.

Becker et al do not explicitly disclose the selection of the AC frequency and relevant surface area to provide less than 1V of drop across an electrode/fluid interface.

Chow et al disclose selection of an electrode width in order to maintain a voltage drop below 1V and avoid electrolysis. (Column 13, line 57 - Column 14, line 3)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Becker et al by selecting electrode geometry to maintain a voltage drop below 1V, as taught by Chow et al, because it would help avoid electrolysis.

8. Claims 13-20 and 26-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker et al (US 6,641,708) in view of Witt et al.

Relevant to claims 13 and 26, Becker et al disclose a system for and a method of applying an electrical current through a fluid-containing cavity comprising: providing a fluid-containing cavity (Column 3, lines 50-55); contacting two electrodes with the fluid in the cavity, (Column 4, line 39 - Column

5, line 2); and applying an alternating current from a current source to the fluid via these two electrodes. (Column 8, line 58 - Column 9, line 4) They also suggest additional electrodes (Column 4, lines 47-56) and describe a method suitable for providing them. (Column 5, lines 2-33)

Relevant to claims 14 and 32, Becker et al disclose the use of voltages below 1000V. (Column 8, line 67 - Column 9, line 4)

Relevant to claims 15, 16, 30, and 31, Becker et al disclose varying conductivity of the cell suspension medium, which is the fluid in contact with the electrodes. (Column 9, lines 4-7) The resistance between electrodes can be maintained below 75 ohms, depending on the selection of this medium.

Relevant to claims 17-19 and 27-29, Becker et al disclose preferred electrode spacing of 1 - 100 microns along the path of current flow. (Column 16, lines 17-29)

Relevant to claim 20, Becker et al disclose the application of alternating current to these electrodes. (Column 8, line 58 - Column 9, line 4)

Becker et al do not explicitly disclose a third electrode disposed in electrical contact with the fluid in a location such that the location of the second electrode is between the locations of the first and third electrodes, or the application of a current between the second and third electrodes.

Witt et al disclose a device and method comprising preparation of three sets of electrodes in an interdigitated array, with different AC signals provided to the electrodes. (Figure 1; Column 5, line 40 - Column 6, line 7)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device and method of Becker et al by providing a third set of interdigitated electrodes with independent AC signal, as taught by Witt et al, because Becker et al suggested additional electrodes and it would provide greater control of the separation.

Allowable Subject Matter

9. Claims 6, 7, and 21 are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is an examiner's statement of reasons for allowance:

Regarding claims 6 and 7, the instant claims are distinguished over prior art by providing alternating current to a fluid within a fluid-containing cavity via two electrodes, wherein the first electrode is disposed in a first portion of the cavity that is separated from the second electrode by a second portion of the cavity, the first portion being wider than the second portion. (Claim 6) Claim 7 further limits the method as using a first electrode having a curved surface to provide substantially uniform electrical resistance. The prior art of record neither teaches nor fairly suggests the combination of limitations recited in these claims. The methods disclosed in the inventions of Becker et al correspond to the limitations of claims 1-5, as discussed above, but no motivation could be seen for modification such as recited in the instant claims.

Claim 21 is distinguished over prior art by providing a method of applying alternating current to a fluid within a fluid containing cavity via three electrodes, wherein at least one of the first, second, and third electrodes are in contact with the cavity via a fluid filled channel that is in fluid communication with the cavity, with one of the first, second, and third electrodes disposed in contact with the fluid in the fluid filled channel. The prior art of record neither teaches nor fairly suggests the combination of limitations recited in these claims. The methods disclosed by the combination of Becker et al (US 6,641,708) and Witt et al correspond to the limitations of claim 13, as discussed above, but no motivation could be seen for modification such as recited in the instant claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey Barton, whose telephone number is (571) 272-1307. The examiner can normally be reached Monday-Friday from 8:30 am – 5:00 pm.

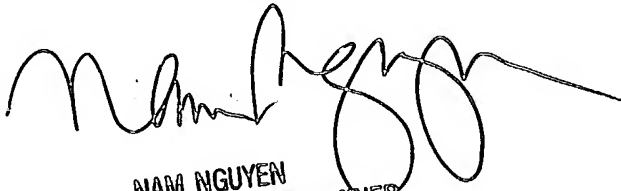
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached at (571) 272-1342. The fax

Art Unit: 1753

number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

JTB
August 16, 2004



NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700